

Chemical Microsensor Instrument for UAV Airborne Atmospheric Measurements, Phase I

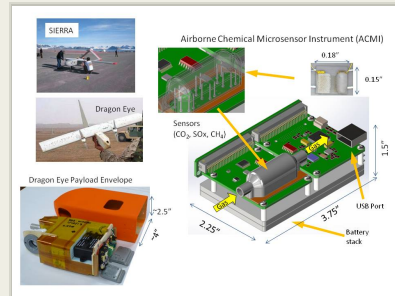
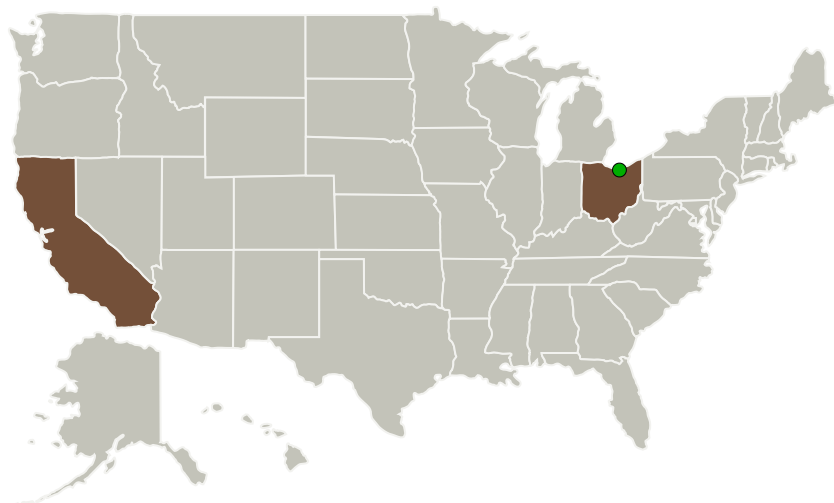
Completed Technology Project (2014 - 2014)



Project Introduction

Makel Engineering, Inc. (MEI) proposes to develop a miniaturized Airborne Chemical Microsensor Instrument (ACMI) suitable for real-time, airborne measurements of trace carbon dioxide, sulfur dioxide, and methane for use on unmanned aerial vehicles (UAVs.) The potential of UAVs to carry instrument packages to support atmospheric science has been demonstrated over the past decade. The rapid expansion of available UAV types and increased mission capability (payload, flight duration, and system cost reductions) offers wide range of potential applications. The instrument package to be developed in the program will adapt low cost and low power chemical microsensor technology which has been demonstrated for fire detection and exhaust emission monitoring to airborne measurements. The fast time response and miniaturized system will provide a lightweight, low cost instrument for package for a wide range of deployments including aerostats (balloons and kites) to UAV such as Dragon Eye and SIERRA. Phase I of the program will fabricate and test a prototype system to demonstrate capability of the instrument.

Primary U.S. Work Locations and Key Partners



Chemical Microsensor Instrument for UAV Airborne Atmospheric Measurements Project Image

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	3
Technology Areas	3
Target Destinations	3

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Organizations Performing Work	Role	Type	Location
Makel Engineering, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	Chico, California
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations

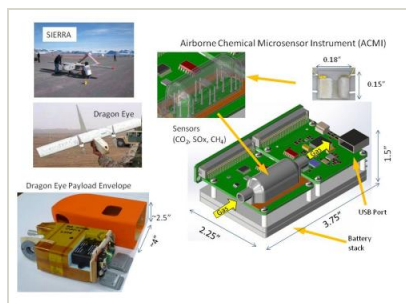
California	Ohio
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Project Transitions

**June 2014:** Project Start**December 2014:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/140578>)

Images

**Project Image**

Chemical Microsensor Instrument for UAV Airborne Atmospheric Measurements Project Image
(<https://techport.nasa.gov/image/127596>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Makel Engineering, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Darby B Makel

Co-Investigator:

Darby Makel

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Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.3 In-Situ Instruments and Sensors
 - └ TX08.3.4 Environment Sensors

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System